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# FROM THE COCKPIT

#### **GREETINGS, CITIZENS!**

Welcome to August's **Jump Point!** As we publish, Alpha 3.24 should've just made it to the live servers polar opposite of what we have in Stanton and we after a few weeks of testing and polishing. We can't wait to explore it for ourselves. hope you're enjoying the new content – it's been a huge undertaking and there's no sign of the As we finish off this month's issue, the Community devs easing off the throttle anytime soon. There's loads of exciting stuff coming up over the next few Showdown 2954. The team kindly shared some of months as we rocket toward Alpha 4.0, and we'll their favorite submissions for the Final Four, while be covering as much of it as we can over the next we scrolled through the Community Hub for a few couple of issues.

To start things off this month, we spoke to Lead Al Programmer Marius Airinei to find out about NPC behavior and how it's developed. The Al Tech team always shares fascinating info in our PU Monthly Report, so we wanted to give them the space to person closer to Alpha 4.0, so get a head start here. go all out. A huge thank you to Marius for taking the time to explain what his team does and how it Thank you for your continued support. impacts the PU and SQ42 – it's a great read.

Then, we're rooting through the Location team's project folders and Miro boards to give you a glimpse at the seriously cool new space stations Jump Point Team

you'll be visiting in Alpha 4.0. The architecture is the

team is currently in the final throes of Ship underdogs that shouldn't be missed (Vance's Meat Terrapin is obviously omitted).

Finally, the Narrative team is back as usual, this time giving us the origins of Pyro's most altruistic group, Citizens for Prosperity. You'll be meeting them in

We'll see you in the 'verse,

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# STAR CITIZENS: AITECH

By the year 2954, Humanity has achieved a great deal. We left Earth, settled the planets around us, jumped trillions of kilometers to distant star systems, and expanded our species' reach farther than anyone ever expected. And while technology made it possible, the will and the drive of Earth's people were the reason we made it this far.

At CIG, Humanity is overseen by the Al team, who give the characters that inhabit our universe life, personality, goals, and purpose – be it helpful, indifferent, or antagonistic to players.

To find out about how *Star Citizen's* non-playable characters (NPCs) are created, we spoke to Lead Al Programmer Marius Airinei; a huge thank you to Marius for taking the time to walk us through everything Al Tech.

## Who are you, what's your role, and what are you responsible for in Star Citizen?

I'm Marius Airinei and I'm the lead Al programmer for the Al Tech team. My main responsibilities are to design, implement, and optimize the Al systems used in both Star Citizen and Squadron 42, while also coordinating and providing support for Al Tech team members.

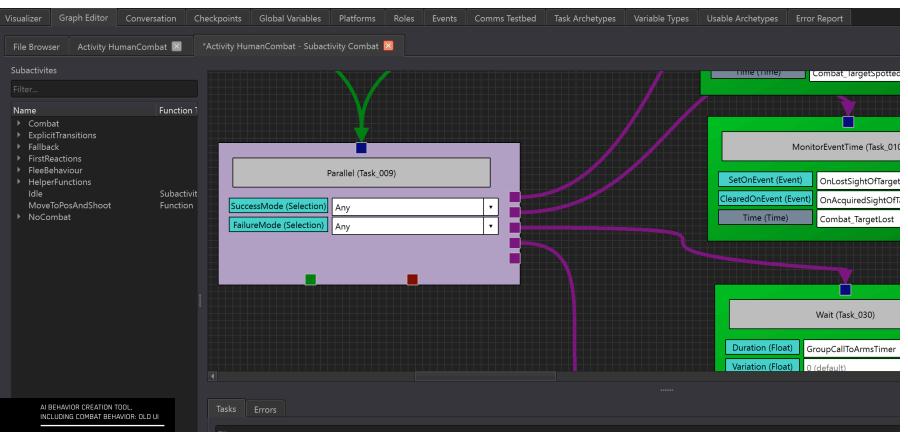
#### What does the AI Tech team do here at CIG?

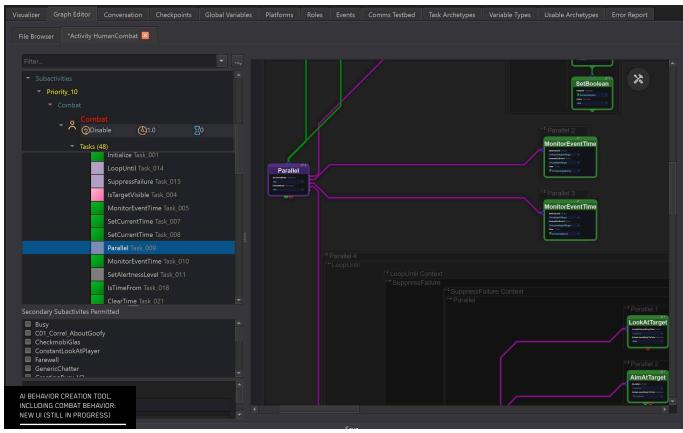
The Al Tech team is responsible for implementing new Al core functionalities and providing support for existing Al systems and functionalities. We are also responsible for making sure both Star Citizen and Squadron 42 run as efficiently as possible.

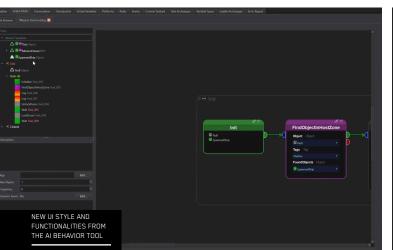
#### What has your team been working on recently?

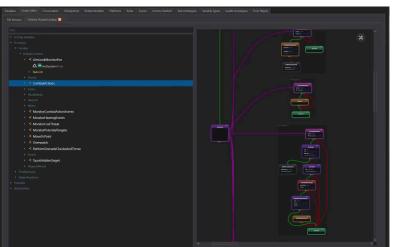
Server Meshing support is a big topic at the moment; for half of the team, this is one of the major focusses. We are updating our Al systems and components (movement system and vision-perception system) to be ready for Server Meshing authority transitions and server recovery. From a player's perspective, we don't want them to be able to distinguish between NPCs that are in one server or another, when they transition between servers, or when they restart their state when a server crashes.

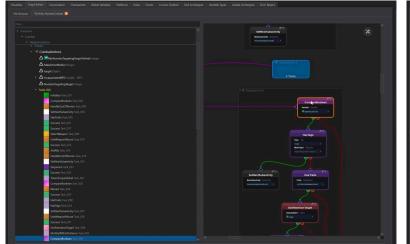
To do this, we need to make sure data syncs correctly into the replication layer, determine what actually needs to be synchronized, and how the code will cope with those changes while still keeping the same functionality as before. Elsewhere, we are working on supporting more procedural generation of Al data and we will show some cool stuff as soon as possible!

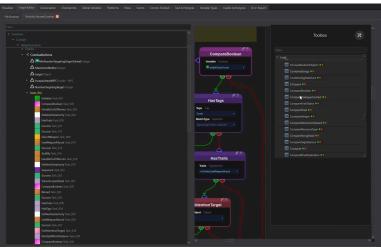












We also keep focusing on improving the spaceship dogfight behavior and the ability for NPCs to cope with all the new ship functionalities that the Vehicle team is adding for the players.

We are focusing on improving our current tools too, especially on the Subsumption side. We are redesigning the whole interface that we call StarScript. This will allow us to better inspect our data and will improve the creation process, allowing designers to have auto-layout of their graphs and a much better way to navigate their data.

#### What are you currently working on?

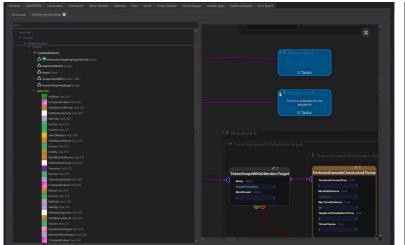
I am currently focused on enhancing navigation-mesh generation, particularly by refining the triangulation algorithm used in creating navigation tiles. These improvements aim to address connectivity issues between neighboring tiles, which are currently hindering NPCs from

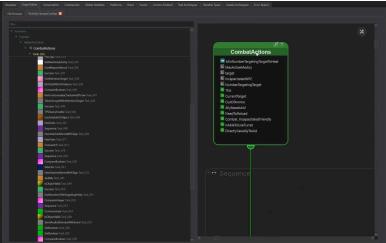
finding shorter and smoother paths. Additionally, I am participating in discussions on Server Meshing and optimizations while also providing support to the team.

#### What's next?

Server Meshing work will be ongoing. We are also looking into how those changes can improve the existing synchronization approach we share with the players. Optimization will be also a large focus in the future due to our focus on closing down Squadron 42 and Star Citizen.

Work on Al Tools will continue, especially related to improved UI and new features. We are also looking into making things more procedural and dynamic, improvements on Al perception and reactiveness, and improving the data structure and validation to reduce designers and programmers' mistakes.





JUMP POINT MAGAZINE //

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DEVELOPER INTERVIEW
AI TECH

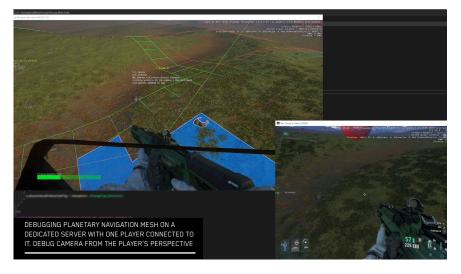
#### **USABLES**

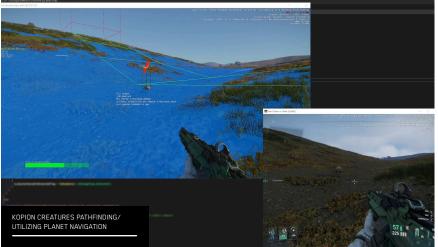
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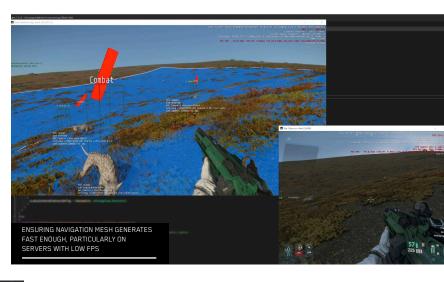
# We hear a lot about 'usables' from your team in our PU Monthly Reports. It'd be great to find out more about what they are and what they do.

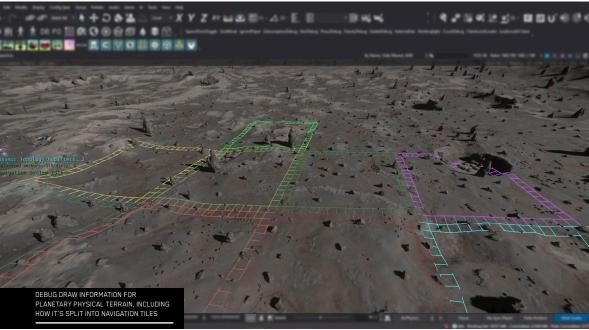
When we talk about usables, we talk about the description required for NPCs to interact with objects in the world. Usables are basically just representing the Al's knowledge of the world, the description of the functionalities that are offered from each object and how to approach them to perform specific operations.

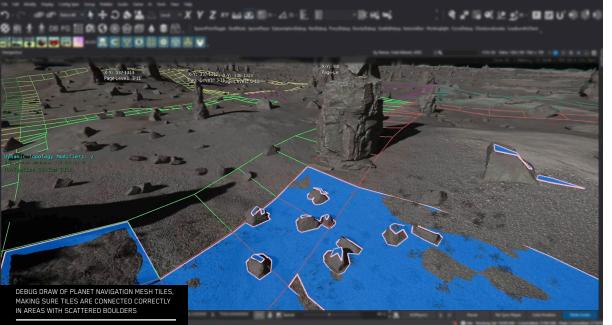
As an example, a chair will offer the functionality to 'occupy' the space in the world

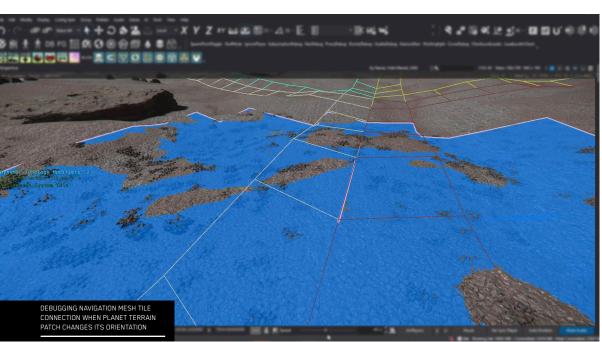


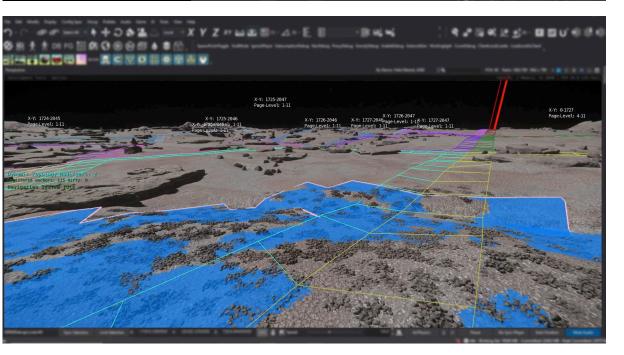












that the chair itself identifies. So, an NPC can search for something they can use to 'occupy' the world.

## How do NPCs choose which usables to utilize, and what stops them from using the wrong one?

The key is NPC logic being behavior centric. What we mean by this is the fact that usables don't do anything per se and they are only meaningful if NPCs have the intention to use them.

A behavior can search for a specific object that allows the agent to perform an operation.

For example, an engineer can search for a wall panel to inspect, a janitor can find a carryable to pick up that has been marked as 'dirty', and a pilot can search for a seat to occupy that is marked as valid for a pilot.

Once the search returns a valid usable, it's always the behavior that maintains the appropriate context, so that if something goes wrong or cannot be performed, the logic can handle the failure in the appropriate way.

#### Technically, how are usables set up?

Usables are basically metadata on top of engine entities that are, often, also interactable entities. Usable data is split into three subsections:

A **use channel** is the action you can perform from that usable. For example, any carryable can expose 'take' and 'drop' use channels, a chair can expose an 'occupy' use channel, and a wall panel can have an 'open', 'close', and 'inspect' use channels.

An **alignment slot** is the location a character will be when performing specific operations. There are as many alignment slots in a usable as many locations at which a character can be when interacting with that object; so, chair can have two alignment slots, one to sit on it and one to talk with somebody sitting in it.

A **use slot** identifies the virtual location an operation takes place. In some ways, the number of use slots is a good indication of the number of NPCs that can use the same usable at the same time (this is not necessarily always true though). A three-seats couch, for example, will have three use slots that are associated with three different alignment slots. This means that the NPCs can potentially sit at the same time on that couch.

A shop counter can have a use slot that represents the location both a vendor and a customer will place and take the object they want to sell/buy, but also another use slot to identify the location the vendor can use to take one of the items from one of the drawers of the counter. In this case, both use slots will be associated to the same alignment slot. This means that, despite having multiple use slots, only one vendor can use the counter at a time.

DEVELOPER INTERVIEW
AI TECH

#### **BEHAVIORS**

#### What are behaviors and what do they do?

Behaviors are the descriptions of the logic NPCs want to perform to achieve a specific goal. They describe the flow of their actions; you can imagine them as the story of what an NPC wants to do.

As an example, let's imagine the behavior to use the firing range of a spaceship. An NPC might want to use the firing range to train, so it will first need to search for a usable allowing it to 'take' a weapon. Then, it will have to use that usable and the outcome of that operation is that the NPC will hold a weapon in its hands. At this point, the NPC will search for a free space in the firing range, or a location where it can wait its turn to approach the firing range. Once that is available, it will move to the firing range and trigger a 'train' use channel on the firing range counter. This logic will include the handling of the firing range training exercise.

#### How do behaviors and usables work together?

Usables allow behaviors to look good in the environment and are the elements that are actually allowing NPCs to physically interact with the environments. Behaviors in our games are not just playing animations, they actually are about interacting with the world, so if the world has no usables, it is not a world the Al can interact with.

#### How are behaviors determined for each NPC?

Designers can assign specific NPCs to run specific behaviors, they can let a schedule determine which behaviors they should run at specific times of the day, or they can request assignments. Assignments can either be special behaviors we provide, such as defending an area or moving to a location, or custom logic the designers hand to an NPC to perform as it's described.

#### Technically, how are behaviors set up?

Behaviors are set up in our Apollo tool, which is our internal interface to Subsumption. As mentioned above, it is now being updated to use the StarScript UX. Activities (this is what we call behaviors) are a sort of container that can identify the best sub-activity (and actual behavior graph) that should run. Designers can specify the properties used by the system to evaluate the available sub-activity and select the most appropriate one.

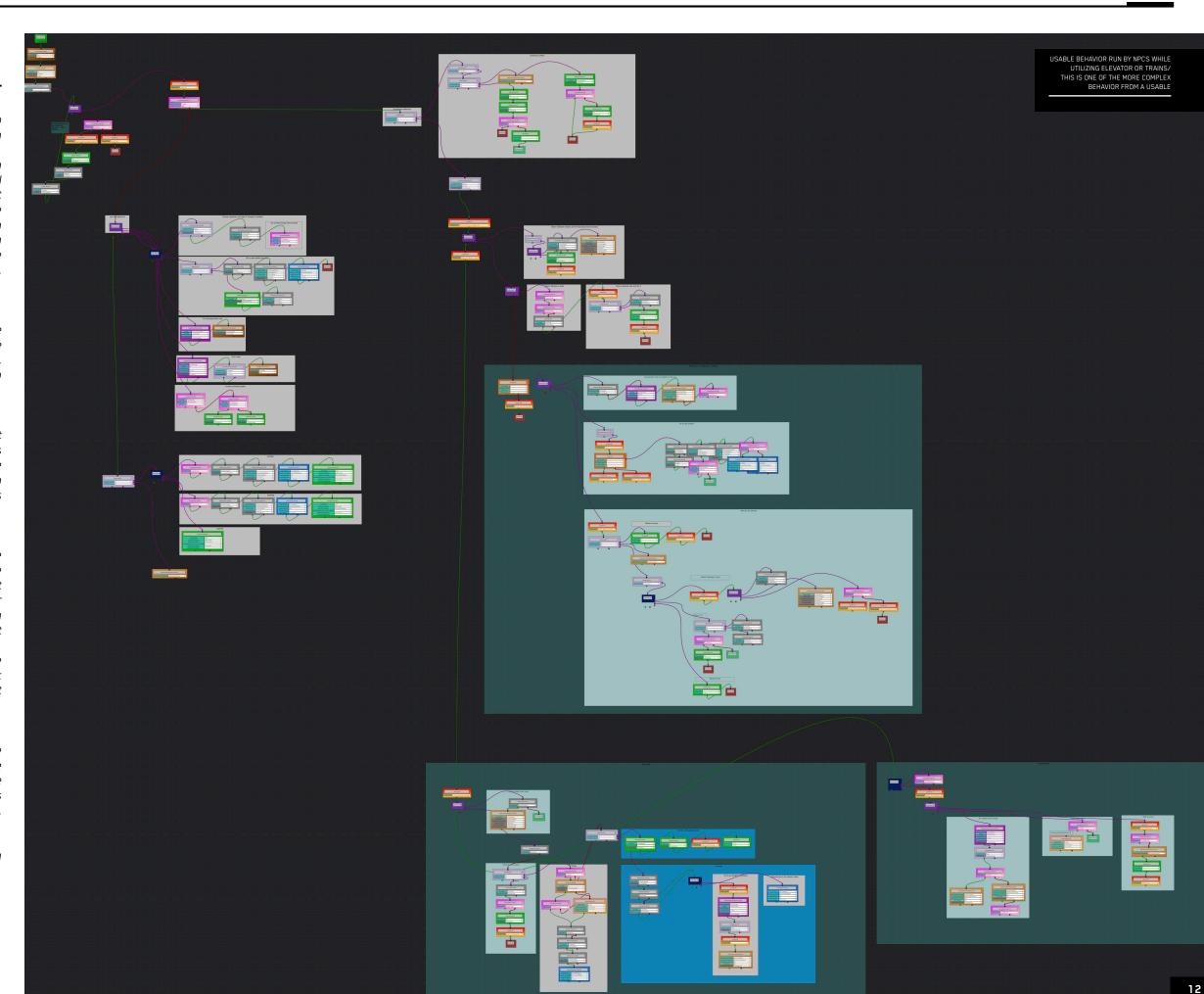
On top of that, we have a mastergraph. This is a large state machine that drives external requests and events. It also handles systemic reactions, such as when NPCs enter combat, and determines the most appropriate activity for that specific event.

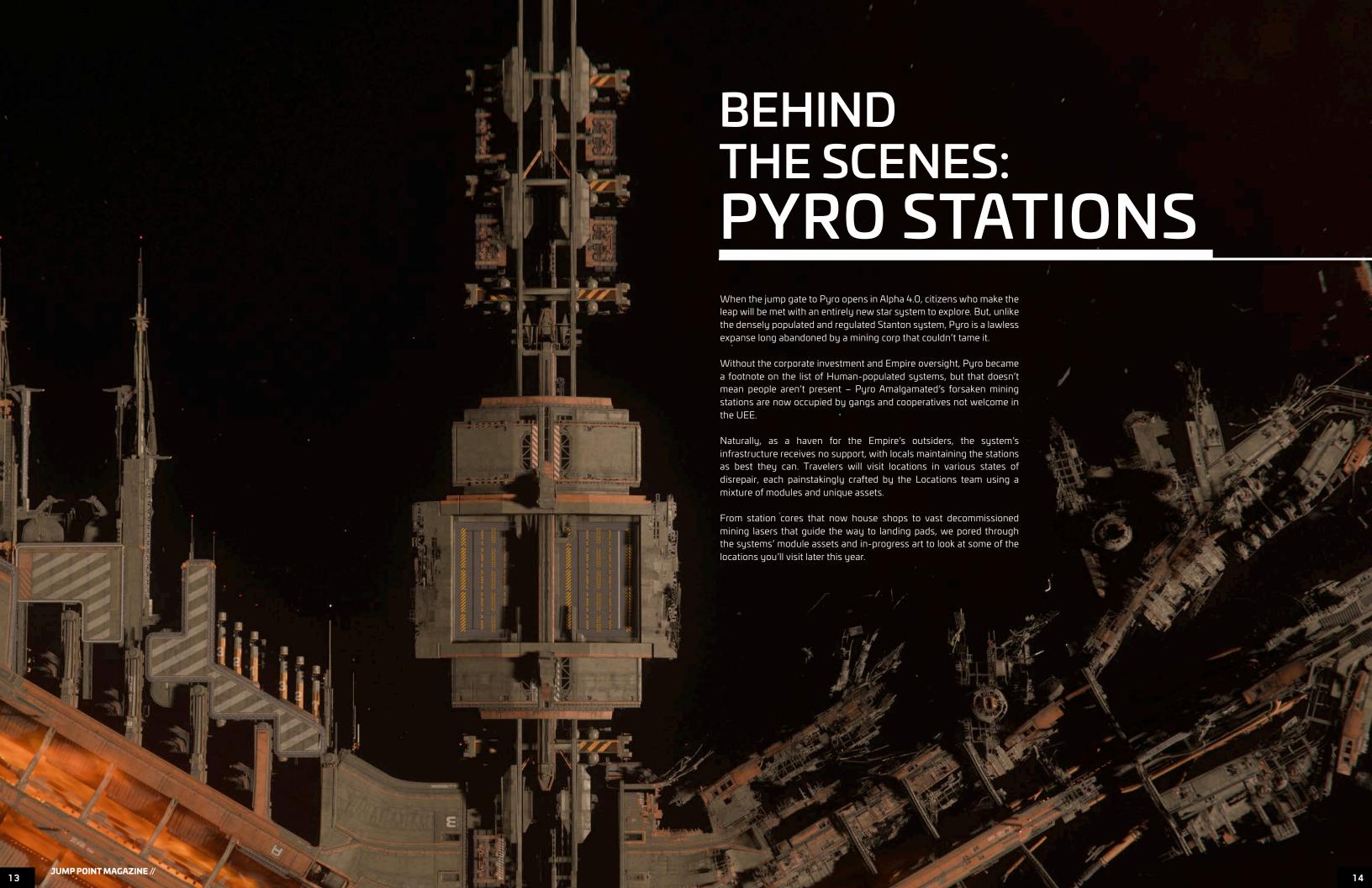
#### How do usables and behaviors differ between the PU and SQ42?

They don't, most of the behaviors are supposed to be exactly the same between the PU and SQ42. However, not all the behaviors we worked on for SQ42 are in the PU due to usables not being available or animations and functionality being polished. But, the idea is there is no technical requirement for behaviors that differ between the projects.

#### Are mission givers or SQ42 cast characters, set up the same way?

Yes, all characters are set up the same, as we want to have the ability for any NPC to use all the work we are doing.





BEHIND THE SCENES **PYRO STATIONS** 

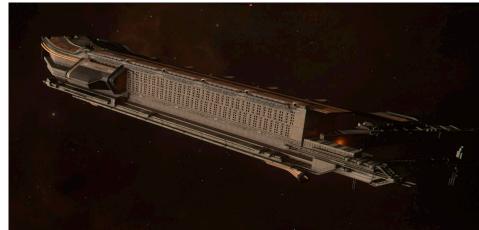






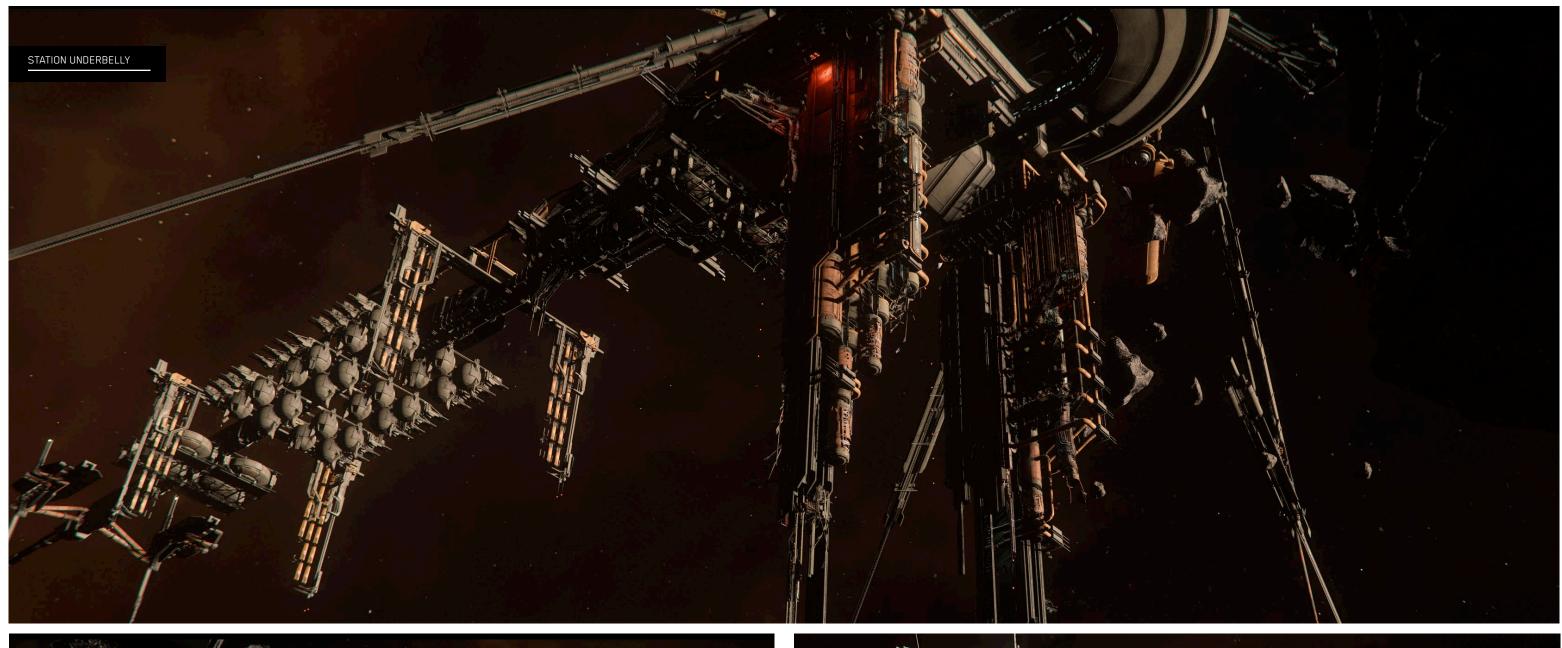








BEHIND THE SCENES
PYRO STATIONS



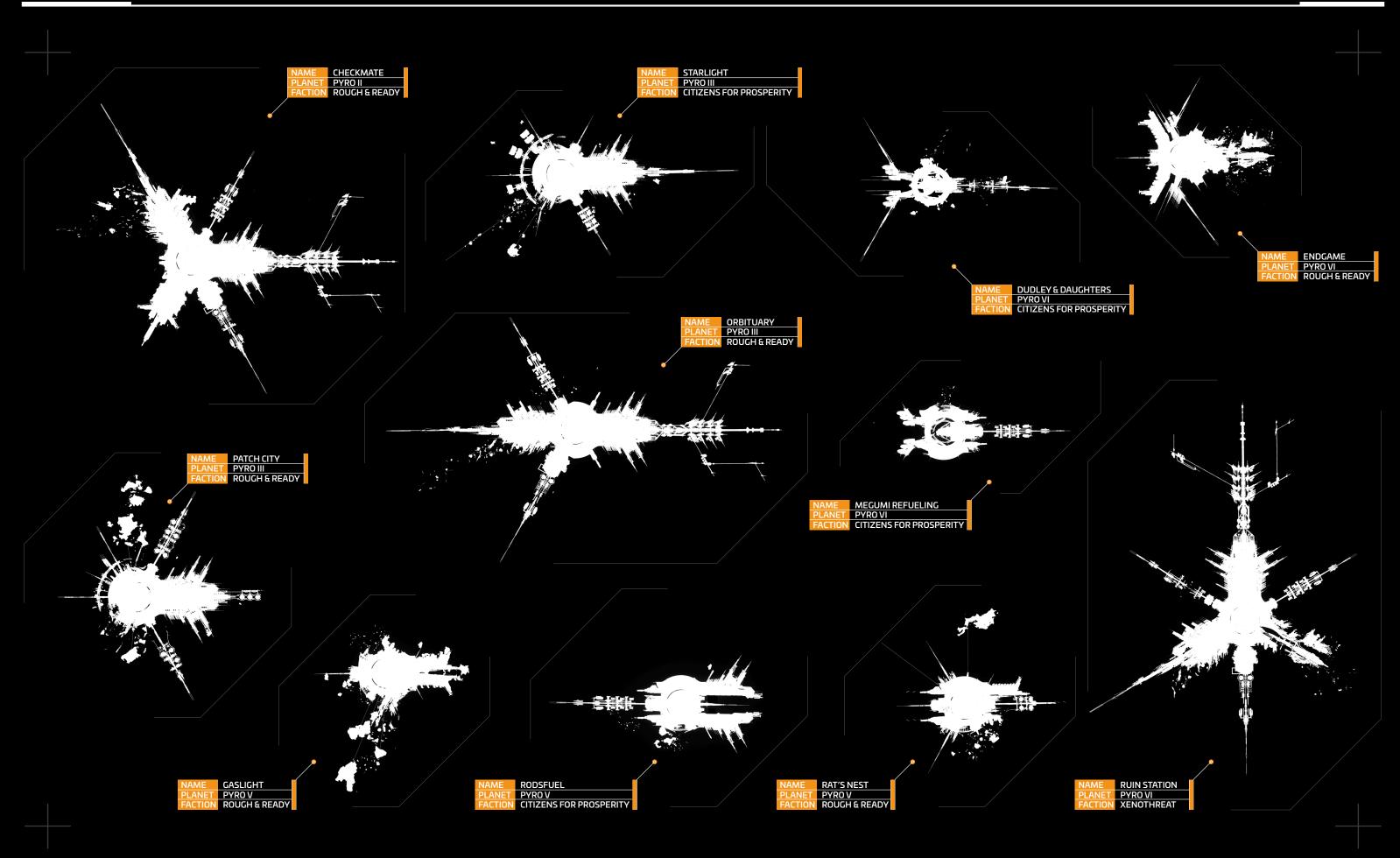






BEHIND THE SCENES

PYRO STATIONS



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SHIP SHOWDOWN 2954 FINAL FOUR







# CRUSADER C1 SPIRIT

FLYABLE: 19TH NOVEMBER 2023 [IAE 2953]

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Owner of the Stanton II gas giant and its landing zone, Orison, Crusader Industries is a true titan of the aerospace industry. But, despite its success and ubiquity in the industrial sector, privately-owned ships bearing the Crusader logo have been a rare sight until recently. However, following the success of the small-business-focused Mercury and demilitarized Hercules hauler, Crusader has officially entered the civilian market, and its most accessible ship yet

still retains the industry focus its known for.

Combining high usability with the unique styling that encapsulates Crusader's much bigger industrial ships, the reason for the C1 Spirit's popularity is clear. To see the C1 Spirit make the Final Four of Ship Showdown was no surprise, with many at CIG favoring it for the win in the studio pool.



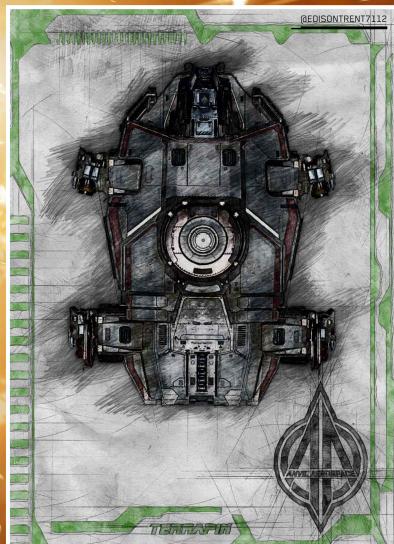


# ANVIL TERRAPIN

FLYABLE: APRIL 1, 2018 (ALPHA 3.1)

Anvil Aerospace is one of the most prolific Human shipbuilders and has been continuously providing battle-hardened war machines to the UEE Navy for nearly two centuries. At the forefront of military technology and the frontlines since its founding in 2772, Anvil ships are welcomed and feared across every known system, depending on which side of the war you're on.

While Anvil is best known for its combat ships (see fellow finalist, the F8C Hornet), it was the little Terrapin explorer that helped the military forge deeper into the unknown. And while its inclusion in the Final Four might not be entirely sincere, the little turtle certainly has its cheerleaders, not just in the community, but at CIG too.



SHIP SHOWDOWN 2954

# **AEGIS RECLAIMER**

FLYABLE: APRIL 1, 2018 (ALPHA 3.1)

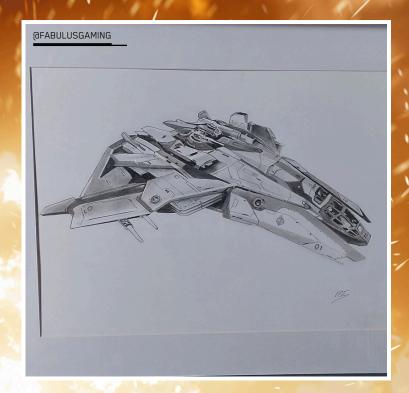
The oldest Human military shipbuilder, Aegis Dynamics has a deep history marred by its connection to the brutal Messer regime that controlled the UEE between 2546 and 2792. Almost exclusively military, Aegis ships only exist if there's a defense need for it, with the Reclaimer taking up the role of recovery and reclamation on behalf of the Navy.

The Aegis Reclaimer became flyable back in Alpha 3.1 alongside the Tumbril Cyclone, MISC Razor, Nox Kue, and fellow finalist, the Anvil Terrapin. Unlike the compact ground vehicles and littlest explorer, the Aegis Reclaimer is a four-limbed behemoth that looks unlike anything in the 'verse, then or now.













# ANVIL FBC LIGHTNING

FLYABLE: OCTOBER 10, 2023 (STAR CITIZEN'S BIRTHDAY)

For years, the Anvil F7 was the UEE Navy's go-to fighter. More than capable of taking out rogue gunships or running down alien incursions, its hard-hitting loadout and versatile variants have kept Humanity safe for decades. And while the F7 series remains more than viable, increased threats from the Vanduul necessitated an upgrade. Larger, faster, more dangerous, the F8C entered the 'verse on Star Citizen's 10th birthday in October last year.

Initially only available to Wing Commander-level backers (who could fly it the day of release), citizens across the galaxy could take the reigns of this once-exclusive war machine by finding platinum or gold tickets dotted around Stanton. Although a rare and elusive ship, its popularity is proven by its inclusion in 2024's Ship Showdown Final Four.

SHIP SHOWDOWN 2954

BEST OF THE REST







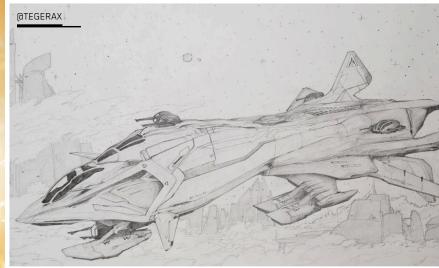




















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PORTFOLIO CITIZENS FOR PROSPERITY



The run was a haul Kyuwa Endicott had done hundreds of times: flying processed food from Stanton to settlements in Pyro and returning with iron and hephaestanite. Born and raised in Pyro, Kyuwa knew the system intimately and how vital his hauls were to those eking out an honest living. Yet, Kyuwa's run on that fateful day in April of 2947 would be different. His ship exited quantum near the Pyro-Stanton jump and arrived in the middle of a firefight between rival gangs. Amidst the chaos and confusion, Kyuwa's ship came under attack and he was killed.

"Kyu saw a different side of the system than most folks. He knew it

could be more than an outlaw haven," recalled his best friend Madge "Dash" Hartford. "Kyu did that run religiously to help old friends and keep new ones from slipping into a life of crime to survive. He was the most optimistic and inspiring person I've ever met."

Hartford was devastated by Kyuwa's death and eventually sought solace at a grief and bereavement support group. There she befriended others who'd lost loved ones to outlaws in Pyro. During one meeting, Hartford admitted she might only ever find comfort by exacting revenge upon those who killed Kyuwa. Much to her surprise, several people

approached her after the meeting to say they felt the same. This group began to associate outside of meetings and discuss how they could change Pyro for the better.

"Let's just say our intentions were admirable but none of us were in a good place. What started as a way to blow off steam quickly evolved into us upgrading our gear and organizing military-style training exercises," said Hartford.

Eventually, Hartford quit her job as an accountant for Hurston and began

organizing raids into Pyro. These incursions lead to clashes with some outlaws and their encampments but also the loss of many friends.

"At a certain point I began to wonder if it was worth it. We'd take losses clearing a settlement only to return days later to see that a new group had moved in." Exasperated, Hartford told a friend that the only way they could ever stop this cycle was by living at the cleared settlement themselves. The idea stuck with Hartford and, in 2949, she stopped organizing and leading raids into Pyro. Instead, Hartford filled her ship with processed food and began doing Kyuwa's old run.

PORTFOLIO CITIZENS FOR PROSPERITY



#### BUILDING A BEACHHEAD

Hartford's hauls were about more than the supplies. Along the way, she took the time to talk with those making an honest living and ask how else she could help. Hartford initially found people in Pyro to be untrusting of her. Many were loners, paranoid that she was collecting intel for one of Pyro's gangs or content with the devil they knew. Yet, she continued to do the hauls and built a rapport with folks in several outposts. They taught Hartford how to navigate the constant coronal mass ejections, where to avoid unless she wanted trouble, and most importantly, what supplies were always in constant demand. As Hartford learned about the challenges and intricacies of the system, she came to believe that the path to peace in Pyro would be through profitability.

"Things that can make real, systemic changes in Pyro, like companies or the government, will only come if it's beneficial to their bottom line," claimed Hartford in a 2950 interview announcing her founding of Citizens for Pyro (CFP). She spoke to anyone and everyone about her vision and how her new group would lay the groundwork for others to live within and profit off the system. Branded as "Build a Beachhead," Hartford's plan consisted of clearing, holding, and populating sites around Pyro to foster the growth of legitimate business and trade. She envisioned a series of strongly fortified and strategically located settlements where a legitimate hauler, miner, or salvager could safely work, live, and travel between. Once the CFP established a substantial foothold, Hartford believed bigger businesses and organizations would be drawn into Pyro and be willing to help establish real law and order.

Hartford painted an enticing picture but pulled no punches about how difficult it would be initially to establish and protect these sites. She believed it would be foolish to deny that there would be resistance from local gangs. Yet, instead of dwelling on it, Harford focused on how people could make their fortune in Pyro. Specifically, highlighting how advances in mining would help access resources previously undiscovered or deemed not worth the effort, that the system contained special harvestables, and that centuries of Human habitation meant scrap was abundantly scattered about.





PORTFOLIO CITIZENS FOR PROSPERITY

Hartford courted both residents of Stanton and Pyro to join Citizens for Pyro. While some became enamored with her vision, others only saw folly. Initially, she hoped to partner with her former raiding party to coordinate attacks on encampments that the CFP could then occupy. Most refused to join believing that she was turning her back on the 'real fight.' Meanwhile, settlements in Pyro rejected the help and upgraded security measures offered by the CFP, fearful that it would only draw gang attention and anger. Materials and credits donated during Hartford's initial media blitz announcing the creation of the CFP quickly dried up. Zealous volunteers grew to understand the true obstacles ahead and lost faith in the mission. The group seemed destined to fade into obscurity. Then, in early 2951, XenoThreat attacked Stanton and everything changed for the Citizens for Pyro.

#### PROSPERITY FOR ALL

XenoThreat's incursion sent shockwaves through Stanton. The inability of the corporate-led governments to coordinate an effective response and repel the attack forced the Advocacy to mobilize the Civilian Defense Force to save the system. Suddenly, Pyro's gang problem had become Stanton's.

Hartford went on another whirlwind media tour. Doing countless interviews with news outlets and Spectrum shows about the CFP's mission and preaching that the only way to solve Stanton's problems would be to address the root of the issue in Pyro. Volunteers and donations flowed to the CFP in record numbers. Even Hartford's old raiding party put their differences aside and joined. These combat veterans handpicked







and trained recruits, and by mid-2951, began raiding and then holding gang encampments in Pyro. Hartford was eager to prove that the CFP could stake their claim in Pyro, though she would later admit that the plan never was to hold these specific sites long term. Instead, the CFP strategy was to draw gang attention to these locations and force outlaws to defend Pyro instead of raid Stanton. Meanwhile, covert plans were underway to occupy and hold several strategically important outposts across the system. In 2952, Hartford gave an interview to Observist Lifestyle claiming the plan was to have "a base of operations within Pyro, preferably on Pyro II or Pyro III, within the next five years." Believing XenoThreat and other Pyro gangs carefully monitored her media appearances, Hartford exaggerated the CFP's timeline. As of the writing of this article in 2954, the CFP have already established several bases in Pyro, including Jackson's Swap on Pyro II and Canard View on Pyro VI, and have plans to establish more. "I wouldn't call this a beachhead just yet," said Hartford. "I call it a beginning."

Though Hartford remains cautiously optimistic about the CFP's

progress in Pyro, others around the empire have looked to it as a model for how to address an issue plaguing many systems. Politicians, militia leaders, civilian security services, and more have all reached out to the group for advice. This inspired Hartford to organize a conference with representatives from the other systems connected to Pyro (Cano, Castra, Hadrian, Nyx, and Terra) to explain their plan and gauge interest in starting CFP chapters of their own. Soon after, CFP members were escorting representatives from these systems and others, including Davien, Nexus, and Virgil, around their bases in Pyro and sharing operational information. The immense interest in CFP operations drove Hartford to think bigger, and in March of 2954, she officially rebranded the Citizens for Pyro into Citizens for Prosperity. Branches of the CFP now exist in several systems across the Empire, and even the unclaimed Nyx system, with plans to expand to more.

"Pyro isn't the only system where this could work," said Hartford. "Kyu always told me to be positive and dream big, so I think this change is a fitting way to honor his legacy."

WHETHER
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IS PERSONAL,
PRECIOUS OR
DANGEROUS,
YOU CAN
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COVALEX.

Featuring a fleet of trusted contractors and centuries of experience, Covalex knows how to handle your shipment and get it there in time.



